

138,803

PATENT



SPECIFICATION

*Date of Application, June 16, 1919. No. 15,107/19.*

*Complete Left, June 23, 1919.*

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PROVISIONAL SPECIFICATION.

Improvements in the Valve Gear of Internal Combustion Engines.

We, HERBERT WOODGATE, of 157, Fulham Road, Onslow Square, London, W., Major, and ARTHUR MAIN, of 83, Eastbourne Gardens, Whitley Bay, Northumberland, Lieutenant, do hereby declare the nature of this invention to be as follows:—

5 This invention relates to internal combustion engines and has for its object to provide simple and positively operating gear for the operation of the inlet and exhaust valves.

The invention is especially applicable to engines in which the cylinders are arranged in line or in which the oppositely disposed cylinders or those that  
10 are adjacent and opposed have a synchronous cycle so that thus the effective stroke takes place simultaneously in the opposed cylinders.

According to the invention sliding members are mounted in the sides of the crank casing, to the outer ends of which the valve rods are secured while the opposite ends are provided with contact rollers to engage with a cam  
15 mounted upon the cam shaft.

The invention comprises the features which are hereinafter described.

In carrying the invention into effect in its application to an internal combustion engine in which adjacent and opposed cylinders have a synchronous cycle, we advantageously provide two exhaust valves and casings and one inlet  
20 valve and casing for each of the respective cylinders. The valves are held normally closed by a laminated spring member and the opening of the valves is positively effected on operation from the respective cam shafts. For this purpose sliding members or pistons are mounted on the one side in the crank case and on the other side in the crank case cover within a cylinder suitably  
25 provided for the purpose. These sliding members or pistons have at their inner ends a roller engaging the cams on the centrally disposed cam shaft while at the outer end they are provided with a boss for the reception of the ball end of the valve rod, the opposite end of which is connected to a valve operating lever in a similar manner. It will be understood that on the outward move-  
30 ment of the valve rods, the stems of the valves are moved inwardly for opening against the pressure of the laminated spring by which the valve is maintained closed.

Dated this 16th day of June, 1919.

35

EDWARD EVANS & Co.,  
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Agents for the Applicants.

[Price 6d.]

Price 4s 6d.

## COMPLETE SPECIFICATION.

## Improvements in the Valve Gear of Internal Combustion Engines.

We, HERBERT WOODGATE, of 157, Fulham Road, Onslow Square, London, W., Major, and ARTHUR MAIN, of 83, Eastbourne Gardens, Whitley Bay, Northumberland, Lieutenant, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to internal combustion engines and has for its object to provide simple and positively operating gear for the operation of the inlet and exhaust valves of the kind wherein reciprocating members, carrying rollers through which they are operated from a cam shaft, effect the opening of the valves against the action of springs tending to close them.

The invention is especially applicable to engines in which the cylinders are arranged in line or in which the pairs of oppositely disposed cylinders, which may have their axes not in line in the plane of the crank shaft, have a synchronous cycle, so that thus the effective stroke takes place simultaneously in the opposed cylinders.

The invention consists in the combination of elements forming the valve operating gear.

According to the invention the means for operating the valves comprise in combination sliding members mounted in the crank casing and carrying contact rollers at one end to engage with a cam mounted upon a cam shaft, valve rods, valve operating levers, ball joint, connections between the valve rods and the sliding members and between the valve rods and the valve operating members, and laminated springs serving to close the valves.

The invention comprises the features which are hereinafter described.

The invention is illustrated in the accompanying drawing which represents a sectional elevation of an internal combustion engine constructed according to the invention.

In carrying the invention into effect as illustrated in the accompanying drawings in its application to an internal combustion engine in which adjacent and opposed cylinders have a synchronous cycle, we advantageously provide two exhaust valves and casings *a* and one inlet valve and casing *b* for each of the respective cylinders. The valves are held normally closed by a laminated spring member *c* and the opening of the valves is positively effected on operation from the respective cam shafts *d*. For this purpose sliding members or pistons *e* are mounted on the one side in the crank case *f* and on the other side in the crank case cover *f*<sup>1</sup> within a cylinder suitably provided for the purpose. These sliding members or pistons *e* have at their inner ends a roller *e*<sup>1</sup> engaging the cams on the centrally disposed cam shaft *d* while at the outer end they are provided with a boss *g* for the reception of the ball end of the valve rod *h*, the opposite end of which is connected to a valve operating lever *i* in a similar manner. It will be understood that on the outward movement of the valve rods *h*, the stems of the valves are moved inwardly for opening against the pressure of the laminated spring *c* by which the valve is maintained closed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In internal combustion engines of the type described, means for operating the valves comprising in combination sliding members mounted in the crank

casing and carrying contact rollers at one end to engage with a cam mounted upon a cam shaft, valve rods, valve operating levers, ball joint connections between the valve rods and the sliding members and between the valve rods and the valve operating members, and laminated springs serving to close the  
5 valves, substantially as described.

2. A multi-cylinder internal combustion engine having valve operating means as specified in the preceding claim, wherein the opposed pairs of cylinders have a synchronous cycle, substantially as described.

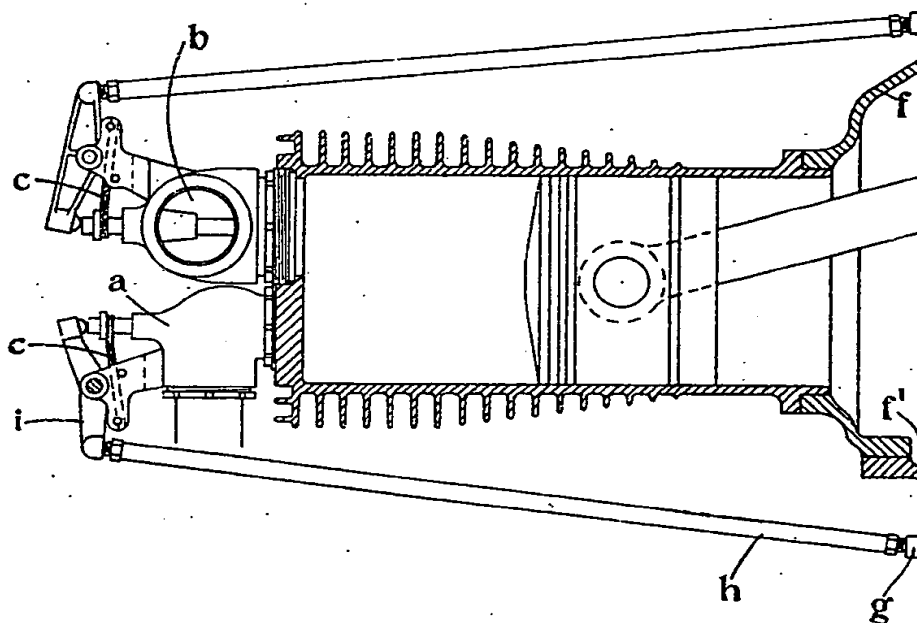
3. Means for operating valves of internal combustion engines, substantially  
10 as hereinbefore described with reference to the accompanying drawings.

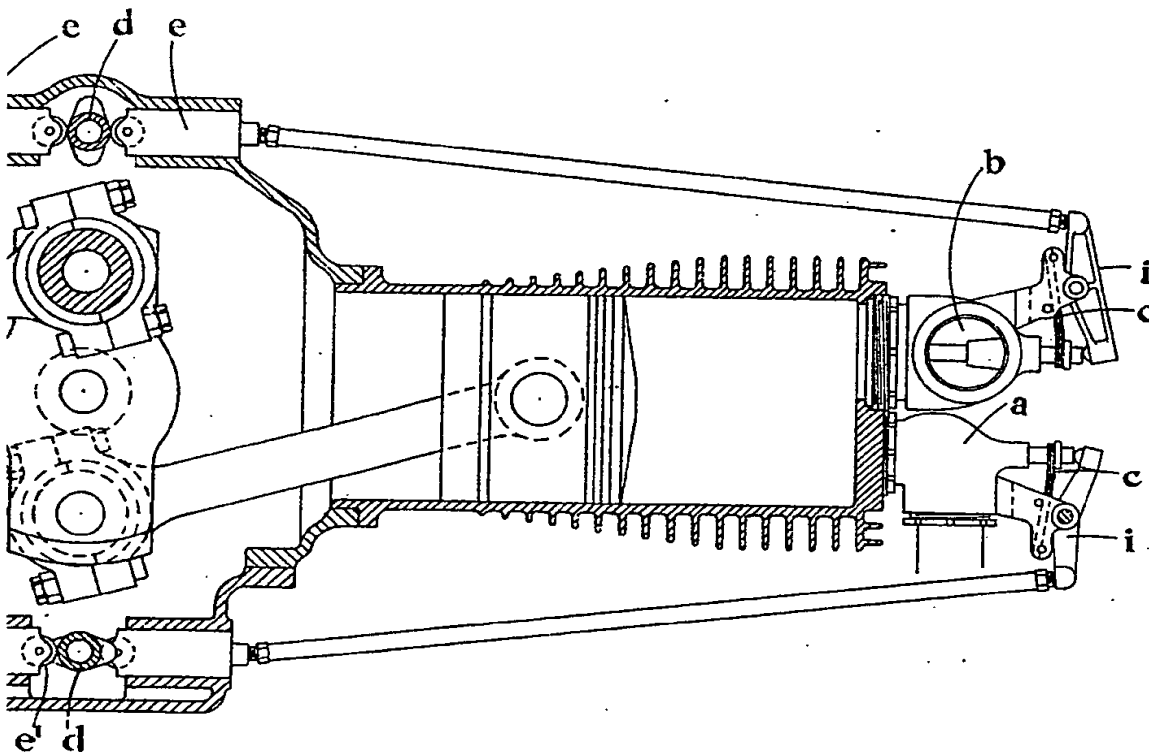
Dated this 23rd day of June, 1919.

EDWARD EVANS & Co.,  
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Agents for the Applicants.

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*This drawing is a reproduction of the Original on a reduced scale.*





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